

6.3

Compound Inequalities

YOWZA!!

A **Compound Inequality** is 2 inequalities connected by the word "and" or "or".

AND inequalities look like this:

$$x \leq 3$$

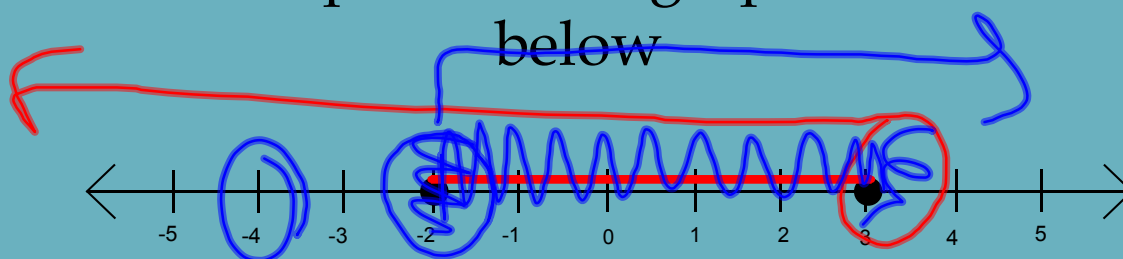
$$x \geq -2$$

$$-2 \leq x \leq 3$$

"-2 is \leq to x AND $x \leq 3$ "

*An AND compound always uses less than symbols!!!

*AND compounds are graphed as shown below



Solve this AND compound inequality.

$$-4 \leq 2x - 6 \leq 4$$

+6 +6 +6

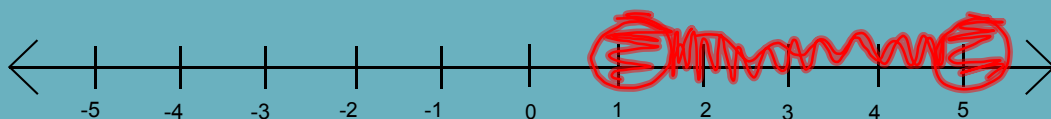
$$\frac{2}{2} \leq \frac{2x}{2} \leq \frac{10}{2}$$

$$1 \leq x \leq 5$$

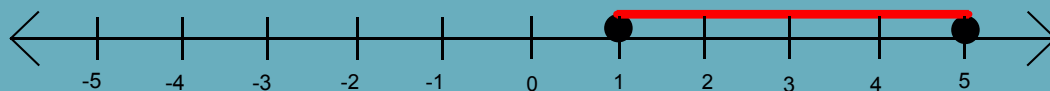
$$< \leq$$

$$< \leq$$

Now graph your solution!



Check yourself.



Now try this one.

$$4 \geq -3x + 1 > -2$$

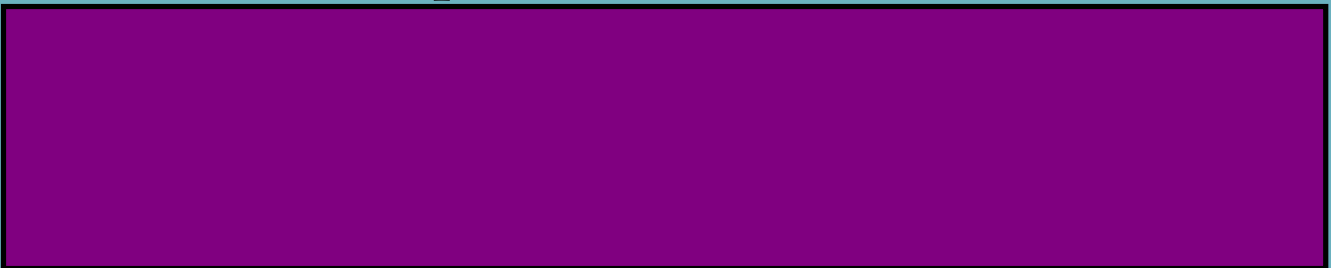
$$4 \geq -3x + 1 > -2$$

$$\frac{3}{-3} = \frac{-3 \times}{-3} > \frac{-3}{-3}$$

$$-1 \leq x < 1$$

*Don't forget to make sure your final answer has Less Than symbols, not Greater Thans.

Solution & Graph to Check Yourself!



OR inequalities look like:

$$6x - 5 < 7 \quad \text{OR} \quad 8x + 1 \geq 25$$

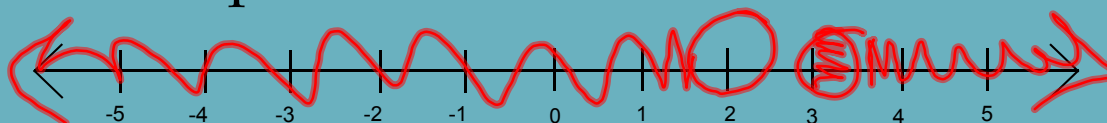
Are Solved like this:

$$6x - 5 < 7 \quad \text{OR} \quad 8x + 1 \geq 25$$

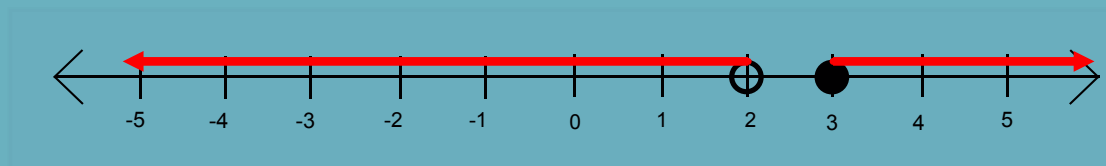
$$\begin{array}{rcl} +5 & +5 & \\ \hline 6x & < & 12 \\ \hline \frac{6x}{6} & < & \frac{12}{6} \\ x & < & 2 \end{array} \quad \begin{array}{rcl} -1 & -1 & \\ \hline 8x & \geq & 24 \\ \hline \frac{8x}{8} & \geq & \frac{24}{8} \\ x & \geq & 3 \end{array}$$

$x < 2 \quad \text{OR} \quad x \geq 3$

And is Graphed like this:



Check Yourself!

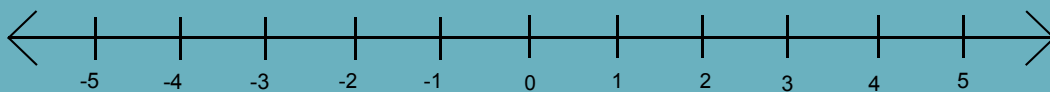


Try solving this OR Compound inequality.

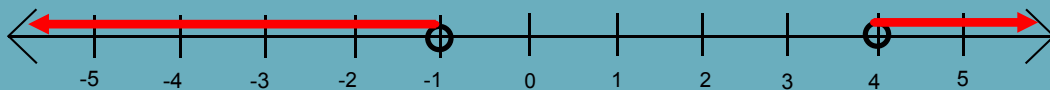
*Don't forget to switch your inequality symbol if you multiply or divide by a negative to solve!

$$-3x + 5 > 8 \quad \text{OR} \quad -x < -4$$

Now graph your solution.



Check yourself.



Write a compound inequality for each situation.

a) Holly spent more than \$20 but less than \$38

b) Patrick weighed at least 120 pounds but no more than 127

c) Maddy ate at least four crackers but less than ten

d) all numbers less than 8 or greater than 21 are Sam's favorite

e) Andy had more than 80 texts or less than 15

You are ready for some
Independent Practice . . . aka
Homework! :)